

## REMARKS

Claims 1, 2, 4, 11-15, 17-21, 24, 25, 28, 29 and 31 have been amended and new claim 32 has been added to more particularly point out and distinctly claim Applicant's invention. Claims 22, 23, 26 and 27 have also been cancelled in their entirety, without prejudice. New matter is not introduced by this amendment. Specifically, support for the phrase "withdrawing an effluent comprising higher molecular weight hydrocarbons and said hydrobromic acid from said second reactor" in independent claim 29 is located in the instant specification at least at page 9, lines 18-20 and page 16, lines 1-3. Support for inclusion of the phrase "contacting said hydrobromic acid, said additional hydrobromic acid, and said higher molecular weight hydrocarbons with water to remove said hydrobromic acid and additional hydrobromic acid from said higher molecular weight hydrocarbons" in independent claim 18 is located in the instant specification at least at page 9, line 18 – page 10, line 6, page 16, lines 1-17, and page 22, lines 10-14. Further, support for the term "vapor" in claims 1, 2, 4, 11-15, 18, 21 and 29 is located in the instant specification at least at page 1, line 11, page 4, line 27, page 5, line 1, page 6, line 25, and page 13, line 5.

Applicants' attorney wishes to thank the Examiner for the courtesy extended during a personal interview conducted on October 19, 2006, at which the inventor of the captioned application, Mr. John J. Waycuilis, was also present. During the interview, the general format of the claim amendments to each independent claim 1, 18 and 29, as presented herein, was discussed. In addition, the deficiencies of the applied reference of record, provisional patent application 60/487,364 listing Lorkovik et al. as inventors, as applied against claims 1-31 and the rejection of claims 1-31 under the provisionally created doctrine of obviousness-type double patenting were discussed. Agreement with respect to the claims was not reached during the interview.

Claims 1, 3, 5-7, 16, 18 and 20-31 stand rejected under 35 U.S.C. § 102 (b) as being anticipated by Ivan Lorkovik et al. "Alkane Oligimerization for the Production of Alkanes, Olefins, Alcohols, Ethers, Fuels, and Aromatics", pages 1-6.

Lorkovik et al. discloses a method for converting methane and other alkanes into higher hydrocarbons, including alcohols, ethers, olefins and gasoline-range materials. In accordance with the process as set forth in the last full paragraph on page 2 of Lorkovik et al., "... the halogenation of methane is followed by a condensation step in which the liberated hydrohalic acid is adsorbed within the same bifunctional material as is catalyzing the condensation. This same bed may then be treated with air or oxygen to liberate halogen for methane halogenation and subsequent condensation or metathesis over a freshly activated bed of zeolite/metal oxide composite." On page 3, Lorkovik et al. notes that "[t]he present invention relates to the discovery of mixed metal oxides, particularly metal oxide impregnated zeolites, for the oligimerization of halogenated hydrocarbons ...." Initially the hydrocarbons are halogenated and then "the halogenated hydrocarbons (and perhaps other reactants such as hydrogen or water) are passed over a supported or unsupported mixed metal oxide to create products and metal halide ...." On page 4, Lorkovik et al. notes that "the production of products ... is accomplished by passing the halogenated products over a metal oxide." And that "[a] number of variables, including feed composition, feed location in the reactor, temperature, pressure, metal oxide composition, and reactor residence time may alter product distribution. Production of alkanes, olefins and aromatics from methane has been detected and confirmed. Also expected is the ability to produce alkanes and olefins of particular branching ..., alcohols, diols, ethers, halogenated hydrocarbons, aromatics ..., and hydrocarbons suitable for fuels such as gasoline, diesel, and jet fuel." It is also noted on page 4 of Lorkovik et al. that the metal oxide composition may shift product distribution, with examples of metal oxide compositions for producing alcohols, olefins and ethers being given. Finally, Lorkovik et al. notes on page 4 that the properties of the zeolite component of the zeolite/metal oxide composite may also be expected to shift product distribution.

The metal oxide/zeolite composite of Lorkovik et al. is termed a "bifunctional material" in that, in addition to catalyzing the product reactions, it also serves to "adsorb" hydrohalic acid that is liberated. The reactor bed of metal oxide/zeolite composite of Lorkovik et al. may then be treated with air or oxygen to liberate halogen for subsequent

methane halogenation. In this manner, “recycling/recovering the corrosive aqueous hydrohalic acid may be sidestepped by regeneration/recovery in situ.”

Independent claim 1 of the captioned application calls in part for “reacting said alkyl bromides in the presence of said hydrobromic acid and a catalyst consisting essentially of a synthetic crystalline alumino-silicate catalyst and at a temperature sufficient to form higher molecular weight hydrocarbons and additional hydrobromic acid vapor.” The transitional phrase “consisting essentially of” excludes any components other than the recited synthetic crystalline alumino-silicate catalyst which would materially affect the basic and novel properties of the invention. It is submitted that this transitional phrase excludes using a zeolite composite that includes a metal oxide such as taught by Lorkovik et al. because the metal oxide in the composite of Lorkovik et al. materially affects product distribution of the catalyst, results in products, such as alcohols and diols, not obtainable by use of a synthetic crystalline alumino-silicate catalyst in the process of the present invention, and functions to adsorb liberated halohallic acid, e.g. hydrobromic acid, contrary to the practice of the present invention.

Independent claim 18 calls in part for “contacting said hydrobromic acid, said additional hydrobromic acid, and said higher molecular weight hydrocarbons with water to remove said hydrobromic acid and additional hydrobromic acid from said higher molecular weight hydrocarbons”. As noted above, Lorkovik et al. discloses that the hydrohalic acid that is liberated in the product production step is adsorbed onto the metal oxide/zeolite composite. Accordingly, it is submitted that Lorkovik et al. does not disclose removing hydrobromic acid from higher molecular weight hydrocarbons by contact with water. Further, Lorkovic et al. teaches away from doing so in the second to last sentence on page 2 which states that “recycling/recovering the corrosive aqueous hydrohalic acid may be sidestepped by regeneration/recovery in situ” thereby eliminating the prior art “disadvantage that the hydrocarbon stream must be separated from a more or less ... aqueous hydrohalic acid stream, and the hydrohalic acid stream must be recycled.” Thus, the disclosure of Lorkovic et al. would lead a skilled artisan away from “contacting said hydrobromic acid, said additional hydrobromic acid, and

said higher molecular weight hydrocarbons with water to remove said hydrobromic acid and additional hydrobromic acid from said higher molecular weight hydrocarbons” as called for in accordance with independent claim 18.

Independent claim 29 calls in part for “introducing said alkyl bromides and said hydrobromic acid into a second reactor containing a synthetic crystalline aluminosilicate catalyst and withdrawing an effluent comprising higher molecular weight hydrocarbons and said hydrobromic acid from said second reactor.” As mentioned above, Lorkovic et al. discloses that liberated hydrohalic acid, e.g. hydrobromic acid, is adsorbed onto the bifunctional metal oxide/zeolite composite in the zone reactor and subsequently treated with air or oxygen to liberate halogen for methane halogenation. Thus, it is submitted that in the process of Lorkovic et al. hydrobromic acid is not removed from a reactor with higher molecular weight hydrocarbon product, let alone a second reactor as set forth in independent claim 29. Nor would it be obvious to a skilled artisan to modify the process of Lorkovic et al. to remove hydrobromic acid from any reactor since to do so would destroy the express function of adsorption of liberated hydrohalic acid as well as the elimination of the recovery/recycling of the hydrohalic acid stream as set forth in Lorkovic et al.

Claims 2, 4, 8-20 and 25-28 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Ivan Lorkovic et al. “Alkane Oligimerization for the Production of Alkanes, Olefins, Alcohols, Ethers, Fuels, and Aromatics”, pages 1-6.

The Examiner stated that “[i]t would have been obvious to one having ordinary skill in the art ... to have modified the process of Ivan by using substantially dry bromine because pure bromine would eliminate the production of undesirable by-products.” There is no disclosure, suggestion or teaching in Lorkovic et al. of using dry bromine and it is submitted that a skilled artisan in possession of Lorkovic et al. would be led away from using dry bromine since Lorkovic et al. teaches that water may be added to the feed (third full paragraph on page 4). Thus, a skilled artisan in possession of Lorkovic et al. would not be led to remove water from a halide in Lorkovic et al. since Lorkovic et al. teaches not only that it is permissible but may also be desirable to include water in the feed to the product production step.

The Examiner further stated that “[i]t would have been obvious to one having ordinary skill in the art ... to have modified the process of Ivan by removing hydrobromic acid as claimed because Ivan teaches that the step of neutralizing hydrohalic acid can be operating in the same reactor or in a distinct reactor ....” At the beginning of the third full paragraph on page 4, Lorkovik et al. notes that “hydrogen halide produced in the halogenation may be neutralized (to form water or alcohol) with the same metal oxide producing the product or with a separate metal oxide in a distinct reactor.” Lorkovik et al. teaches that liberated hydrohalic acid is adsorbed onto the metal oxide composite which is later treated with air or oxygen to liberate halogen. Whether this “neutralization” process takes place in the same or a distinct reactor to that used for product production is immaterial, since in either event, hydrobromic acid will not be removed from higher molecular weight hydrocarbons by contacting same with water as called for in independent claim 18 of the captioned application, nor will the hydrobromic acid be removed as an effluent with higher molecular weight hydrocarbons from the product reactor of Lorkovik et al.

For these reasons and for reasons set forth above with respect to the 35 U.S.C. § 102 rejection, it is submitted that the rejection of claims 2, 4, 8-20 and 25-28 under 35 U.S.C. § 103 (a) as being unpatentable over Ivan Lorkovik et al. is improper and should be withdrawn.

Claims 1-30 stand rejected under 35 U.S.C. § 112, first paragraph. In light of the current amendments to claims 1, 2, 4, 15, 25 and 29 specifying “bromine vapor”, the rejection of claims 1-30 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

Claims 1-21, 24, 25, and 28-31 stand rejected under both 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 112, second paragraph. In light of the current amendments to claims 1 and 18 specifying that alkyl bromides are reacted in the presence of hydrobromic acid and a synthetic crystalline alumino-silicate catalyst, it is submitted that the rejection of claims 1-21, 24, 25 and 28 under both 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 112, second paragraph, and should be withdrawn. Further, in light of the current amendment to claim 29 specifying that alkyl bromides and hydrobromic acid are introduced into the second reactor, it is further submitted that the rejection of claims

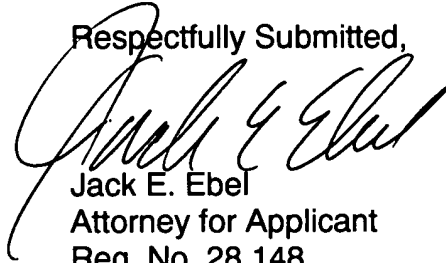
29-31 under both 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 112, second paragraph, should be withdrawn.

Claims 1-31 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting ("ODP rejection") as being unpatentable over claims 1-22 of copending U.S. patent application no. 11/101,886. For reasons set forth in the Amendment submitted with Request for Continuing Examination dated July 7, 2006, it is submitted that the need for filing a terminal disclaimer in the instant application will be obviated at that point in prosecution where all claims present in the captioned application are deemed allowable by the Examiner. At that point in time, the ODP rejection of claims 1-31 as being unpatentable over claims 1-22 of copending U.S. patent application no. 11/101,886 should be withdrawn in the captioned application, which is the earlier filed of the two applications in question. The Examiner commented in the last Office Action that "[s]ince the later filed application has not been examined, there is no way to know whether or not the later filed application is rejectable on other grounds." As stated in the response to this rejection in the Amendment submitted with Request for Continuing Examination, the rejections contained in the later filed application (i.e. 11/101,886), if any, are immaterial to the disposition of the ODP in the captioned application (i.e., the earlier filed application). In either case (whether the ODP is the only rejection of record made in the later filed application or if other rejections of record are made), where the ODP rejection is the only remaining rejection of record in the earlier filed application, M.P.E.P. §804 I.B.1 instructs that the ODP rejection should be withdrawn and the earlier-filed application permitted to issue as a patent without a terminal disclaimer. As the captioned application is the "earlier filed application", at that point in prosecution where the ODP rejection is the only rejection of record, the need for filing a terminal disclaimer in the captioned application is obviated and the ODP rejection of claims 1-31 as being unpatentable over claims 1-22 of copending U.S. patent application no. 11/101,886 should be withdrawn. It is further submitted that in the instance where an ODP rejection becomes the only rejection in the captioned application, it would be improper to extend prosecution of the instant application until the latter filed application is examined.

Atty. Docket No.: 200306 USA

In view of the foregoing, Applicant requests allowance of claims 1-21, 24, 25, and 28-32.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Jack E. Ebel", written over the typed name.

Jack E. Ebel

Attorney for Applicant

Reg. No. 28,148

(303) 980-1805

Facsimile: (303) 980-1808